

chain nodes :

7 8 9 10 11 12 13 14 15 16 17

ring nodes :

1 2 3 4 5 6

chain bonds :

1-7 2-8 3-9 4-11 6-12 10-11 12-13 13-14 14-15 14-16 14-17

ring bonds :

1-2 1-6 2-3 3-4 4-5 5-6

exact/norm bonds :

1-2 1-6 1-7 2-3 2-8 3-4 3-9 4-5 5-6 13-14 14-15 14-16 14-17

exact bonds :

4-11 6-12 10-11 12-13

Match level :

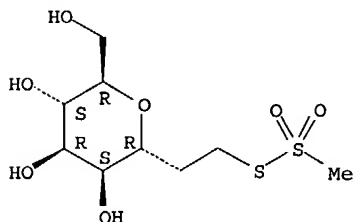
1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:CLASS 8:CLASS 9:CLASS 10:CLASS  
11:CLASS 12:CLASS 13:CLASS 14:CLASS 15:CLASS 16:CLASS 17:CLASS

Element Count :

Node 17: Limited  
C,Cl-5

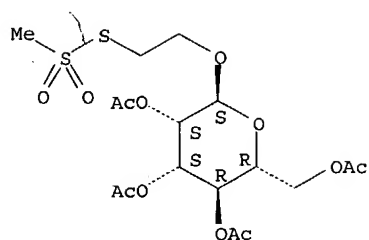
L4 ANSWER 1 OF 1 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2001:112571 CAPLUS  
 DOCUMENT NUMBER: 134:326724  
 TITLE: The controlled glycosylation of a protein with a bivalent glycan: towards a new class of glycoconjugates, glycodendriproteins  
 AUTHOR(S): Davis, Benjamin G.  
 CORPORATE SOURCE: Department of Chemistry, University of Durham, Science Laboratories, Durham, DH1 3LE, UK  
 SOURCE: Chemical Communications (Cambridge, United Kingdom) (2001), (4), 351-352  
 CODEN: CHCOFS; ISSN: 1359-7345  
 PUBLISHER: Royal Society of Chemistry  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 134:326724  
 AB The use of a novel bivalent carbohydrate methanethiosulfonate modification reagent (I), based on a flexible, branched divalent core in a combined site-directed mutagenesis and chemical modification strategy has allowed the first controlled synthesis of a pure protein bearing a branched glycan or a first generation glycodendriprotein. Site-directed mutagenesis was used to introduce one Cys residue into the sequence of subtilisin Bacillus lentus (SBL) to produce variant SBL-S156C, which was reacted with I rapidly and quant. to give first-generation glycodendriprotein S156C-(S-a)<sub>2</sub>, which was purified and its structures confirmed by ES-MS anal.  
 IT 336817-35-7  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (preparation of glycoconjugates of cysteine-modified subtilisin as glycodendriproteins)  
 RN 336817-35-7 CAPLUS  
 CN D-glycero-D-manno-Octitol, 2,6-anhydro-7-deoxy-8-thio-, 8-methanesulfonate (9CI) (CA INDEX NAME)

Absolute stereochemistry.



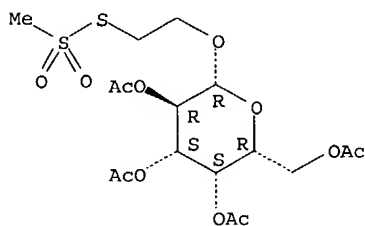
REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

10/062,970



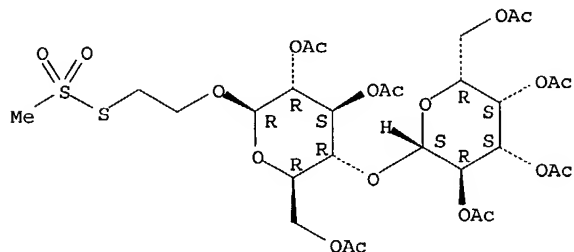
RN 219668-71-0 CAPLUS  
CN  $\beta$ -D-Galactopyranoside, 2-[(methylsulfonyl)thio]ethyl, tetraacetate  
(9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



RN 219668-74-3 CAPLUS  
CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl  
4-O-(2,3,4,6-tetra-O-acetyl- $\beta$ -D-galactopyranosyl)-, triacetate (9CI)  
(CA INDEX NAME)

Absolute stereochemistry. Rotation (-).



REFERENCE COUNT: 81 THERE ARE 81 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 10 OF 11 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 2000:34887 CAPLUS  
DOCUMENT NUMBER: 132:89792  
TITLE: Neoglycoproteins and their preparation by reacting  
cysteine-containing proteins mutants with glycosyl  
thiosulfonate  
INVENTOR(S): Jones, J. Bryan; Davis, Benjamin G.  
PATENT ASSIGNEE(S): Genencor International, Inc., USA  
SOURCE: PCT Int. Appl., 86 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 3  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000001712	A2	20000113	WO 1999-US15138	19990702
WO 2000001712	A3	20000511		
W:	AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
RW:	GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK,			

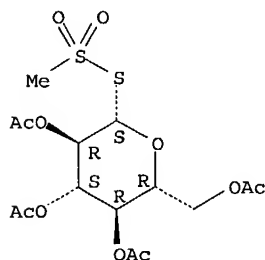
10/062,970

ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG,  
 CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG  
 AU 9952081 A1 20000124 AU 1999-52081 19990702  
 AU 749383 B2 20020627  
 EP 1093459 A2 20010425 EP 1999-937203 19990702  
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,  
 IE, SI, LT, LV, FI, RO  
 JP 2002519050 T2 20020702 JP 2000-558113 19990702  
 US 2002146803 A1 20021010 US 2002-62970 20020201  
 PRIORITY APPLN. INFO.: US 1998-91687P P 19980702  
 US 1999-131446P P 19990428  
 US 1999-347029 A3 19990702  
 WO 1999-US15138 W 19990702

AB The present invention relates to a chemical modified mutant protein including a cysteine residue substituted for a residue other than cysteine in a precursor protein, the substituted cysteine residue being subsequently modified by reacting the cysteine residue with a glycosylated thiosulfonate. Also, a method of producing the chemical modified mutant protein is provided. The present invention also relates to a glycosylated methanethiosulfonate. Another aspect of the present invention is a method of modifying the functional characteristics of a protein including providing a protein and reacting the protein with a glycosylated methanethiosulfonate reagent under conditions effective to produce a glycoprotein with altered functional characteristics as compared to the protein. In addition, the present invention relates to methods of determining the structure-function relationships of chemical modified mutant proteins. Thus, a number of glycosyl methanethiosulfonates were synthesized and reacted with the N62C, the S156C, the S166C, or the L217C mutants of *Bacillus lentus* subtilisin and the resulting neoglycoproteins were characterized. Thus, the L217C mutant was reacted with 2,3,4,6-tetra-O-acetyl- $\beta$ -D-glucopyranosyl methanethiosulfonate to prepare a monoglucosylated enzyme containing 3 acetyl groups. This derivative had a kcat/KM that was 8-fold greater than that of the wild-type enzyme. Addnl. there was an improvement in specificity for ester vs. amide hydrolysis: the ratio (kcat/KM)esterase/(kcat/KM)amidase was 17.2-fold greater than that of the wild-type. This modified enzyme may find use in enzymic peptide synthesis.

IT 219668-45-8P 219668-49-2P 219668-52-7P  
 219668-55-0P 219668-58-3P 219668-62-9P  
 219668-64-1P 219668-67-4P 219668-69-6P  
 219668-71-0P 219668-74-3P 254909-31-4P  
 254909-32-5P 254909-33-6P 254909-34-7P  
 254909-35-8P 254909-36-9P 254909-37-0P  
 254909-38-1P 254909-39-2P 254909-40-5P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (neoglycoproteins and their preparation by reacting cysteine-containing proteins  
 mutants with glycosyl thiosulfonate)  
 RN 219668-45-8 CAPLUS  
 CN  $\beta$ -D-Glucopyranose, 1-thio-, 2,3,4,6-tetraacetate 1-methanesulfonate  
 (9CI) (CA INDEX NAME)

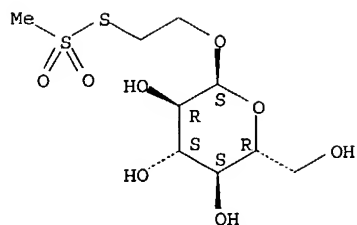
Absolute stereochemistry. Rotation (-).



RN 219668-49-2 CAPLUS  
 CN  $\alpha$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl (9CI) (CA INDEX  
 NAME)

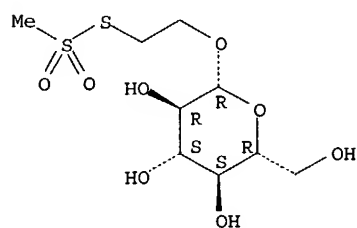
Absolute stereochemistry. Rotation (+).

10/062,970



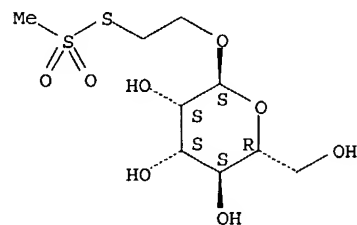
RN 219668-52-7 CAPLUS  
CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).



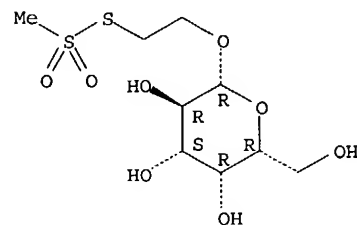
RN 219668-55-0 CAPLUS  
CN  $\alpha$ -D-Mannopyranoside, 2-[(methylsulfonyl)thio]ethyl (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



RN 219668-58-3 CAPLUS  
CN  $\beta$ -D-Galactopyranoside, 2-[(methylsulfonyl)thio]ethyl (9CI) (CA INDEX NAME)

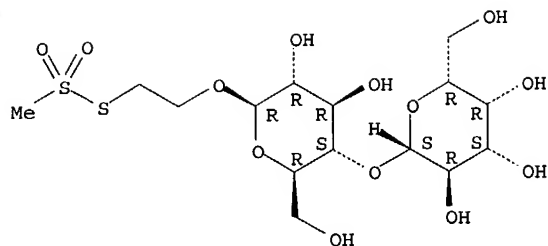
Absolute stereochemistry. Rotation (+).



RN 219668-62-9 CAPLUS  
CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl 4-O- $\beta$ -D-galactopyranosyl- (9CI) (CA INDEX NAME)

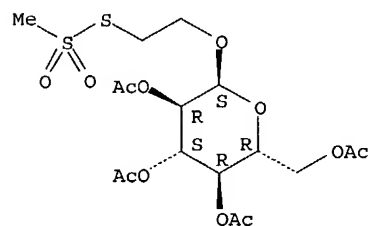
Absolute stereochemistry. Rotation (+).

10/062,970



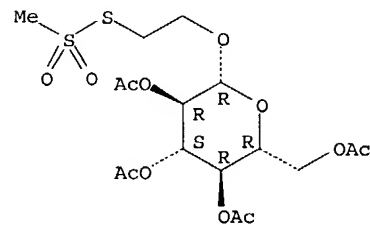
RN 219668-64-1 CAPLUS  
CN  $\alpha$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl, tetraacetate  
(9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



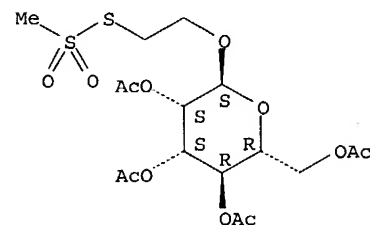
RN 219668-67-4 CAPLUS  
CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl, tetraacetate  
(9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



RN 219668-69-6 CAPLUS  
CN  $\alpha$ -D-Mannopyranoside, 2-[(methylsulfonyl)thio]ethyl, tetraacetate  
(9CI) (CA INDEX NAME)

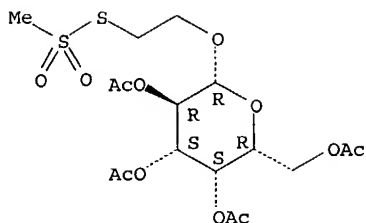
Absolute stereochemistry. Rotation (+).



RN 219668-71-0 CAPLUS  
CN  $\beta$ -D-Galactopyranoside, 2-[(methylsulfonyl)thio]ethyl, tetraacetate  
(9CI) (CA INDEX NAME)

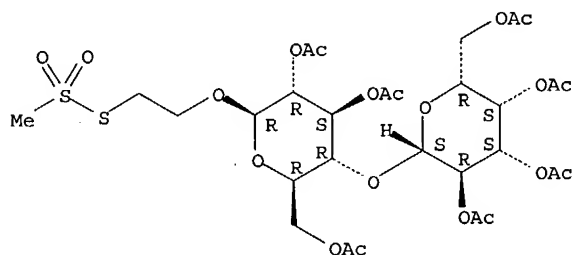
Absolute stereochemistry. Rotation (+).

10/062,970



RN 219668-74-3 CAPLUS  
CN β-D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl  
4-O-(2,3,4,6-tetra-O-acetyl-β-D-galactopyranosyl)-, triacetate (9CI)  
(CA INDEX NAME)

Absolute stereochemistry. Rotation (-).

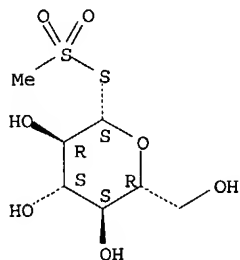


RN 254909-31-4 CAPLUS  
CN β-D-Glucopyranose, 1-thio-, diacetate 1-methanesulfonate (9CI) (CA  
INDEX NAME)

CM 1

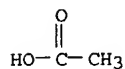
CRN 254909-30-3  
CMF C7 H14 O7 S2

Absolute stereochemistry.



CM 2

CRN 64-19-7  
CMF C2 H4 O2



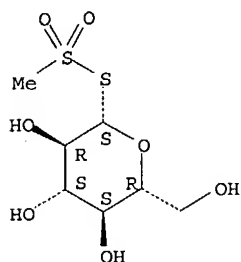
RN 254909-32-5 CAPLUS  
CN β-D-Glucopyranose, 1-thio-, triacetate 1-methanesulfonate (9CI) (CA  
INDEX NAME)

CM 1

CRN 254909-30-3  
CMF C7 H14 O7 S2

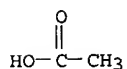
10/062,970

Absolute stereochemistry.



CM 2

CRN 64-19-7  
CMF C2 H4 O2

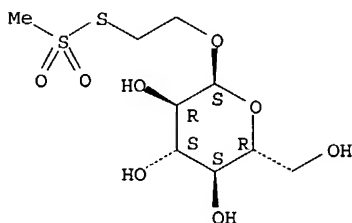


RN 254909-33-6 CAPLUS  
CN  $\alpha$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl, diacetate (9CI)  
(CA INDEX NAME)

CM 1

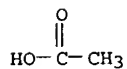
CRN 219668-49-2  
CMF C9 H18 O8 S2

Absolute stereochemistry. Rotation (+).



CM 2

CRN 64-19-7  
CMF C2 H4 O2



RN 254909-34-7 CAPLUS  
CN  $\alpha$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl, triacetate (9CI)  
(CA INDEX NAME)

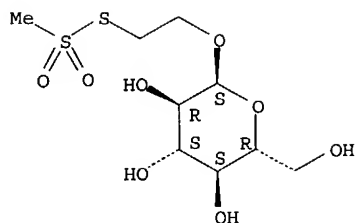
CM 1

CRN 219668-49-2  
CMF C9 H18 O8 S2

Absolute stereochemistry. Rotation (+).



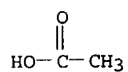
10/062,970



CM 2

CRN 64-19-7

CMF C2 H4 O2



RN 254909-35-8 CAPLUS

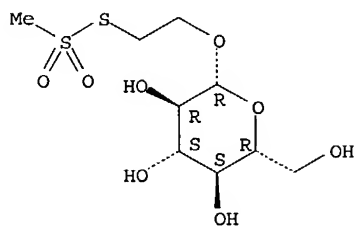
CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl, diacetate (9CI)  
(CA INDEX NAME)

CM 1

CRN 219668-52-7

CMF C9 H18 O8 S2

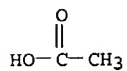
Absolute stereochemistry. Rotation (-).



CM 2

CRN 64-19-7

CMF C2 H4 O2



RN 254909-36-9 CAPLUS

CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl, triacetate (9CI)  
(CA INDEX NAME)

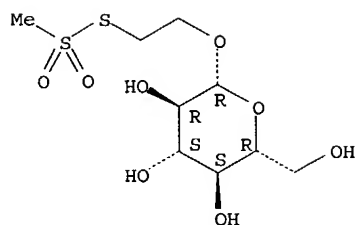
CM 1

CRN 219668-52-7

CMF C9 H18 O8 S2

Absolute stereochemistry. Rotation (-).

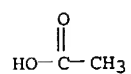
10/062,970



CM 2

CRN 64-19-7

CMF C2 H4 O2



RN 254909-37-0 CAPLUS

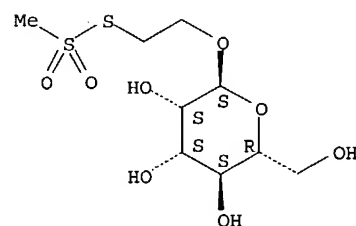
CN  $\alpha$ -D-Mannopyranoside, 2-[(methylsulfonyl)thio]ethyl, triacetate (9CI)  
(CA INDEX NAME)

CM 1

CRN 219668-55-0

CMF C9 H18 O8 S2

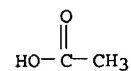
Absolute stereochemistry. Rotation (+).



CM 2

CRN 64-19-7

CMF C2 H4 O2



RN 254909-38-1 CAPLUS

CN  $\beta$ -D-Galactopyranoside, 2-[(methylsulfonyl)thio]ethyl, triacetate  
(9CI) (CA INDEX NAME)

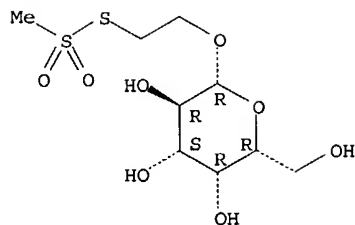
CM 1

CRN 219668-58-3

CMF C9 H18 O8 S2

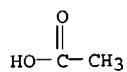
Absolute stereochemistry. Rotation (+).

10/062,970



CM 2

CRN 64-19-7  
CMF C2 H4 O2

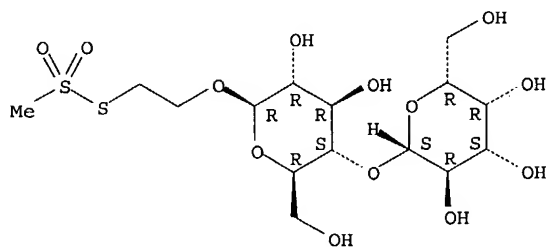


RN 254909-39-2 CAPLUS  
CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl  
4-O- $\beta$ -D-galactopyranosyl-, pentaacetate (9CI) (CA INDEX NAME)

CM 1

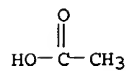
CRN 219668-62-9  
CMF C15 H28 O13 S2

Absolute stereochemistry. Rotation (+).



CM 2

CRN 64-19-7  
CMF C2 H4 O2



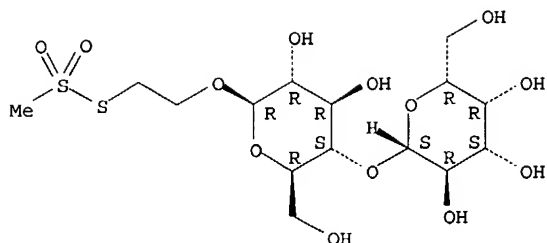
RN 254909-40-5 CAPLUS  
CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl  
4-O- $\beta$ -D-galactopyranosyl-, hexaacetate (9CI) (CA INDEX NAME)

CM 1

CRN 219668-62-9  
CMF C15 H28 O13 S2

Absolute stereochemistry. Rotation (+).

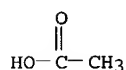
10/062,970



CM 2

CRN 64-19-7

CMF C2 H4 O2



L4 ANSWER 11 OF 11 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:756618 CAPLUS

DOCUMENT NUMBER: 130:110474

TITLE: Controlled Site-Selective Glycosylation of Proteins by a Combined Site-Directed Mutagenesis and Chemical Modification Approach

AUTHOR(S): Davis, Benjamin G.; Lloyd, Richard C.; Jones, J. Bryan  
CORPORATE SOURCE: Department of Chemistry, University of Toronto, Toronto, ON, M5S 3H6, Can.

SOURCE: Journal of Organic Chemistry (1998), 63(26), 9614-9615  
CODEN: JOCEAH; ISSN: 0022-3263

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Site-directed mutagenesis combined with chemical modification provides a general method that allows for both regio- and glycan-specific glycosylation of proteins. The strategy involves the introduction of cysteine at preselected positions and then reaction of its thiol residue with glycomethanethiosulfonate reagents. Four different sites of subtilisin Bacillus lentus (SBL) were mutated to cysteine (SBL-N62C, -S156C, -S166C, -L217C) and glycosylated using a series of protected and unprotected mono- and disaccharide methanethiosulfonates. Through adjustment of pH and appropriate selection of the glycosylation site, differently acetylated glycoforms of SBL were prepared

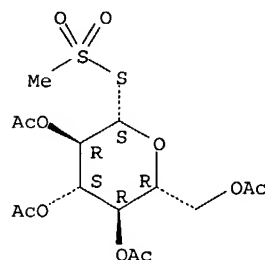
IT 219668-45-8P

RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); RCT (Reactant); SPN (Synthetic preparation); BIOL (Biological study); PREP (Preparation); RACT (Reactant or reagent)  
(controlled site-selective glycosidation of proteins by a combined site-directed mutagenesis and chemical modification approach)

RN 219668-45-8 CAPLUS

CN  $\beta$ -D-Glucopyranose, 1-thio-, 2,3,4,6-tetraacetate 1-methanesulfonate (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).



IT 219668-49-2P 219668-52-7P 219668-55-0P  
219668-58-3P 219668-62-9P 219668-64-1P

pub 12/25/98

10/062,970

219668-67-4P 219668-69-6P 219668-71-0P

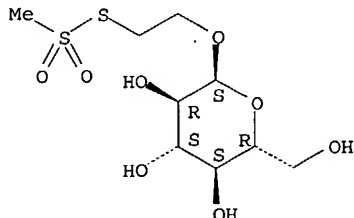
219668-74-3P

RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); RCT (Reactant); SPN (Synthetic preparation); BIOL (Biological study); PREP (Preparation); RACT (Reactant or reagent)  
(controlled site-selective glycosylation of proteins by a combined site-directed mutagenesis and chemical modification approach)

RN 219668-49-2 CAPLUS

CN  $\alpha$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl (9CI) (CA INDEX NAME)

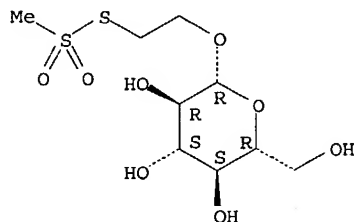
Absolute stereochemistry. Rotation (+).



RN 219668-52-7 CAPLUS

CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl (9CI) (CA INDEX NAME)

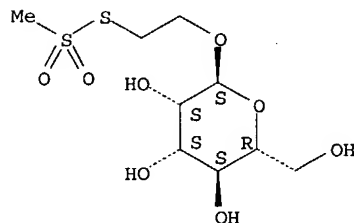
Absolute stereochemistry. Rotation (-).



RN 219668-55-0 CAPLUS

CN  $\alpha$ -D-Mannopyranoside, 2-[(methylsulfonyl)thio]ethyl (9CI) (CA INDEX NAME)

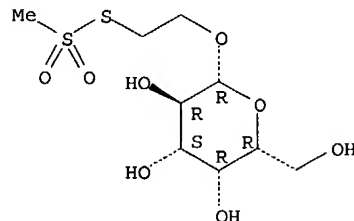
Absolute stereochemistry. Rotation (+).



RN 219668-58-3 CAPLUS

CN  $\beta$ -D-Galactopyranoside, 2-[(methylsulfonyl)thio]ethyl (9CI) (CA INDEX NAME)

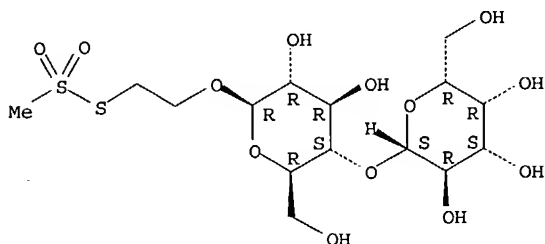
Absolute stereochemistry. Rotation (+).



10/062,970

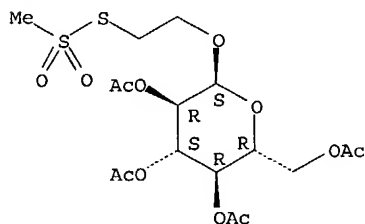
RN 219668-62-9 CAPLUS  
CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl  
4-O- $\beta$ -D-galactopyranosyl- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



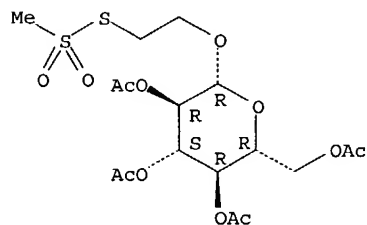
RN 219668-64-1 CAPLUS  
CN  $\alpha$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl, tetraacetate  
(9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



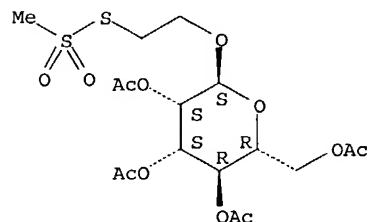
RN 219668-67-4 CAPLUS  
CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl, tetraacetate  
(9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



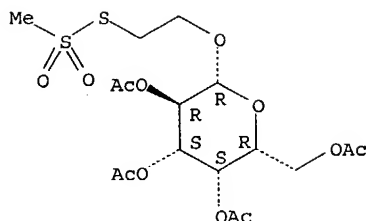
RN 219668-69-6 CAPLUS  
CN  $\alpha$ -D-Mannopyranoside, 2-[(methylsulfonyl)thio]ethyl, tetraacetate  
(9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



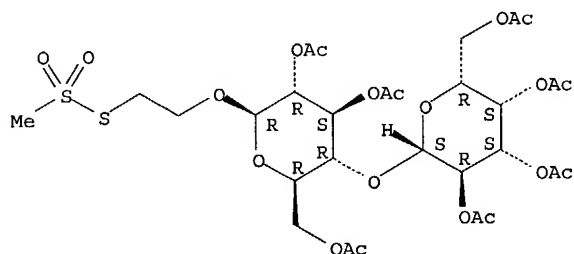
RN 219668-71-0 CAPLUS  
CN  $\beta$ -D-Galactopyranoside, 2-[(methylsulfonyl)thio]ethyl, tetraacetate  
(9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



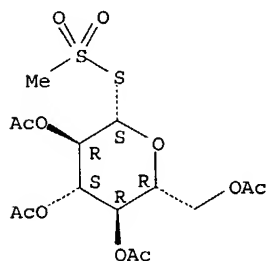
RN 219668-74-3 CAPLUS  
 CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl  
 4-O-(2,3,4,6-tetra-O-acetyl- $\beta$ -D-galactopyranosyl)-, triacetate (9CI)  
 (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).



IT 219668-45-8DP, reaction product with cysteine residues in  
 mutagenized subtilisin 219668-49-2DP, reaction product with  
 cysteine residues in mutagenized subtilisin 219668-52-7DP,  
 reaction product with cysteine residues in mutagenized subtilisin  
 219668-55-ODP, reaction product with cysteine residues in  
 mutagenized subtilisin 219668-58-3DP, reaction product with  
 cysteine residues in mutagenized subtilisin 219668-62-9DP,  
 reaction product with cysteine residues in mutagenized subtilisin  
 219668-64-1DP, reaction product with cysteine residues in  
 mutagenized subtilisin 219668-67-4DP, reaction product with  
 cysteine residues in mutagenized subtilisin 219668-69-6DP,  
 reaction product with cysteine residues in mutagenized subtilisin  
 219668-71-ODP, reaction product with cysteine residues in  
 mutagenized subtilisin 219668-74-3DP, reaction product with  
 cysteine residues in mutagenized subtilisin  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (controlled site-selective glycosylation of proteins by a combined  
 site-directed mutagenesis and chemical modification approach)  
 RN 219668-45-8 CAPLUS  
 CN  $\beta$ -D-Glucopyranose, 1-thio-, 2,3,4,6-tetraacetate 1-methanesulfonate  
 (9CI) (CA INDEX NAME)

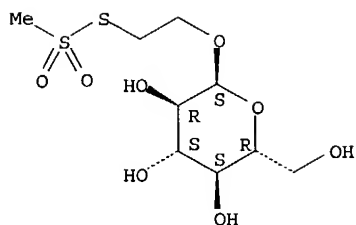
Absolute stereochemistry. Rotation (-).



RN 219668-49-2 CAPLUS  
 CN  $\alpha$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl (9CI) (CA INDEX  
 NAME)

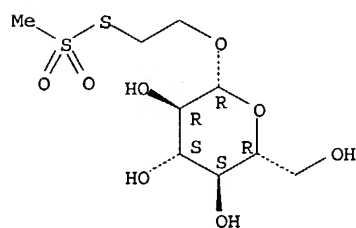
Absolute stereochemistry. Rotation (+).

10/062,970



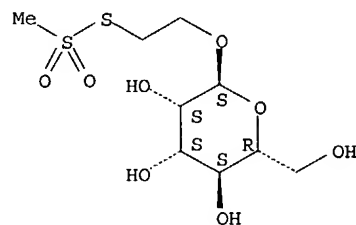
RN 219668-52-7 CAPLUS  
CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).



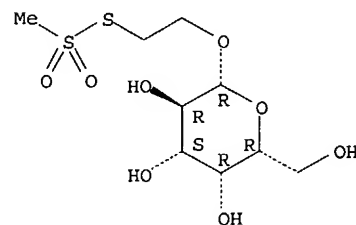
RN 219668-55-0 CAPLUS  
CN  $\alpha$ -D-Mannopyranoside, 2-[(methylsulfonyl)thio]ethyl (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



RN 219668-58-3 CAPLUS  
CN  $\beta$ -D-Galactopyranoside, 2-[(methylsulfonyl)thio]ethyl (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).

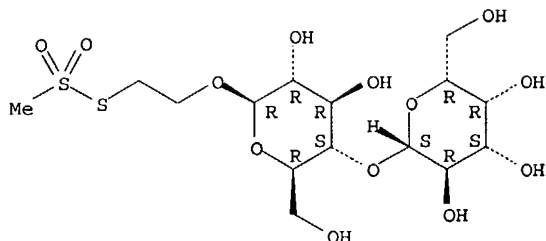


RN 219668-62-9 CAPLUS  
CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl 4-O- $\beta$ -D-galactopyranosyl- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).

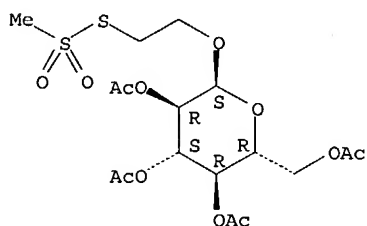


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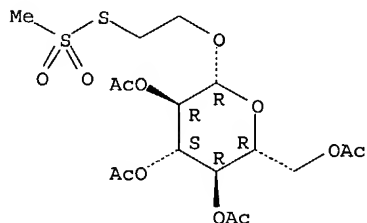
RN 219668-64-1 CAPLUS  
CN  $\alpha$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl, tetraacetate  
(9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



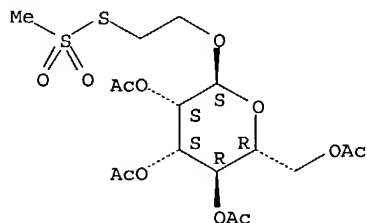
RN 219668-67-4 CAPLUS  
CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl, tetraacetate  
(9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



RN 219668-69-6 CAPLUS  
CN  $\alpha$ -D-Mannopyranoside, 2-[(methylsulfonyl)thio]ethyl, tetraacetate  
(9CI) (CA INDEX NAME)

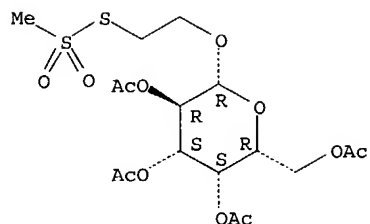
Absolute stereochemistry. Rotation (+).



RN 219668-71-0 CAPLUS  
CN  $\beta$ -D-Galactopyranoside, 2-[(methylsulfonyl)thio]ethyl, tetraacetate  
(9CI) (CA INDEX NAME)

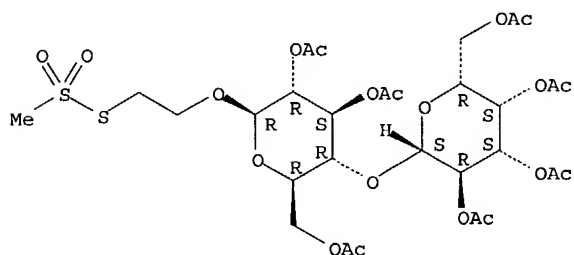
Absolute stereochemistry. Rotation (+).

10/062,970



RN 219668-74-3 CAPLUS  
CN  $\beta$ -D-Glucopyranoside, 2-[(methylsulfonyl)thio]ethyl  
4-O-(2,3,4,6-tetra-O-acetyl- $\beta$ -D-galactopyranosyl)-, triacetate (9CI)  
(CA INDEX NAME)

Absolute stereochemistry. Rotation (-).



REFERENCE COUNT: 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT